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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,541	07/15/2003	Stephane Lascaud	Q68047	2181

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EXAMINER

BERHANU, SAMUEL

ART UNIT	PAPER NUMBER
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2838

DATE MAILED: 03/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Ab

Office Action Summary

Application No.

10/030,541

Applicant(s)

LASCAUD;BAUDOIN;BETTEGA;BARRAULT

Examiner

Samuel Berhanu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/15/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 11-13 is/are rejected.
- 7) ☐ Claim(s) 6-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/15/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "CPC1", "CPC2", "CPCn" in Figure 1. The drawings are also objected to under 37 CFR 1.83(a) because they fail to show descriptive labels for Figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 6, 7, 8 and 10 are objected to because of the following informalities:

Claim 6: "range of temperatures" in line 1, lacks antecedence

Claim 7: symbol "T", in the formula $I_{\text{charge}} = A \exp [-B/2T] * S$, is not defined

Accordingly

Claim 8 is objected to under 37 CFR 1.75(c) as being in improper form because

a multiple dependent claim can depend only on one claim or should refer other claims in the alternatives only. See MPEP § 608.01(n). Accordingly, claim 8 has not been further treated on the merits.

Claim 10: "said voltage difference" in line 1, lacks antecedence. For examination purposes, claim 10 is considered to be dependent on 9.

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by DeLuca et al. (US 4,238,721)

As to Claim 1, DeLuca et al disclose in Figure 1 and column 2 lines 49-52, a system and method of charging several electrochemical cells (11), in particular Lithium-Polymer cells, connected in series to a charger (15) which allows adjusting the voltage and the charging current, the method comprising permanently detecting the voltage of each cell (Figure 1, element 17, column 3 lines 55-60), and when a cell reaches a predetermined threshold voltage (column 2, lines 65-67), shunting the current of that cell (column 2 lines 67-68 and column 3, lines 1-3, column 5, lines 28-36, Figure 3 element 21), simultaneously connecting in parallel to said several cells, a shunt resistor

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of a current equivalent to the increment of the charging current of said several cells (column 5, lines 28-32), and by, when each of the subsequent cells reaches said threshold voltage, connecting also in parallel to each cell, a shunt resistor of a current equal to the increment in the charging current of said several cells (column 5, lines 28-32). Regarding the limitation of "when a first cell reaches the threshold voltage applying an increment to the charging current of said several cells, It is inherent that when the current across any cell is shunted, the charging current through any other cells will be increased and the shunt resistor current will be equivalent to the charging current, and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or inherent.

As to claim 2, DeLuca discloses from the time when the increment is applied to the charging current of said several cells, if the non-shunted part of the current results in overcharging in one of the cells which has reached the threshold voltage, applying at least one decrement to the charging current until the voltage of said cell is again equal to the threshold voltage (column 8, lines 42-45).

As to claim 11, DeLuca discloses a system and method for charging electrochemical cells (Figure 1, elements 11, and 15), in particular Lithium-Polymer cells, connected in series to charger (Figure 1, elements 15, 11 and 13) which allows adjusting the voltage and the charging current, for implementing the method according to claim 1, said device comprising means, for detecting the voltage in each cell, (Figure 1, elements 17, 19A and 19B), column 8, lines 29-35), means for shunting the current of each cell (Figure 1, element 21) means for connecting the shunting means to each cell (column 5, lines

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28-32, Figure 3 , element 27), characterized in that it further comprises means for comparing the voltage of each cell with a threshold voltage (figure 1, element 23, column 4 lines 28-31), means for applying an increment to charging current of the said several cells (Figure 1 , element 17, Column 7 lines 55-57) when the voltage in one of the said several cells reaches a threshold voltage and means for shunting a part of the current equivalent to the increment (Figure 1, element 21, column 5, lines 30-31).

As to Claim 12, DeLuca disclose a method and system for charging electrochemical cells in series, characterized in that the means for detecting the voltage of each cell comprises a voltage sensor associated with each cell (Figure 1, element 19(A)), the means for shunting the current of each cell comprises a resistor (Column 5, lines 24-28, Figure 3, element 29), associated with each cell, the means for connecting the shunting means comprises a switch (Column 5, lines 28-29, Figure 3 element 29), associated each, the means for comparing the voltage comprises a voltage sensor (Figure 1, element 19(A and B)) associated with each cell and connected to a control unit (figure 1, element 17, 19A and 19B) which operates said switches (Column 5, lines 28-29, figure 3, element 29), the means for applying an increment of the charging current comprising said control unit (Figure 1, element 17)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al.

As to claim 3 and 6, DeLuca doesn't explicitly disclose the amount or percentage of the shunting current and the range of temperature. However, it has been held that discovering an optimum range is routine in the art. (In re Aller, 105 USPQ 233). Accordingly, it would have been obvious to a person having ordinary skill in the art to shunt an appropriate amount of current in Deluca's shunt module so as to protect the battery from over charging.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al (US 4,238,721) in view of Sherman (US 3,917,990)

As to Claim 4, Deluca teaches a System and method for charging electrochemical cells in series, (see rejection above, paragraph 4 under 35 USC 102). However, Deluca does not explicitly disclose that the charging current of all the cells is calculated as a function of temperature of each of the cells.

Sherman teaches the charging current of all the cells could be calculated as a function of the temperature of each of the cells (Column 1, lines 46-53, lines 60-68 and column 7, lines 41-48). It would have been obvious to a person having ordinary skill in the art to modify Deluca's Module by adding a temperature-sensing resistor for each cell and attach it with the controller, in order to avoid battery damage due to overcharging and heating.

As to Claim 5, Deluca does not teach that if the temperature of at least one of the cells is outside a desired range of temperature, the cells are heated or allowed to cool

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until their temperature is in the desired range. However, Sherman discloses that if the temperature of at least one of the cells is outside a desired range of temperature, the cells are heated or allowed to cool until their temperature is in the desired range (Column 3, lines 18-35). It would have been obvious to a person having ordinary skill in the art to modify DeLuca's battery charger and equalizer by adding a sensitive resistor closer to the battery cells, as taught by Sherman in order to monitor and control the temperature of the battery cells and prevent overcharging.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeLuca et al (US 4,238,721) in view of Lenhart et al. (US 6,025,696)

As to claim 13, DeLuca does not disclose the control unit comprises means for comparing the outputs of temperature sensors of each cell to a threshold temperature. DeLuca however, does disclose in column 3, lines 67-68 that additional leads may be employed to monitor various other parameters. Lenhart discloses in Figure 1 and column 4, lines 64-67 means for comparing the outputs of temperature sensors of each cell to a threshold temperature. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify DeLuca's device and add a temperature sensor as taught by Lanhart so as to further protect against overcharging.

Allowable Subject Matter

9. Claims 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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10. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (For examination purposes, claim 10 is considered to be dependent on 9).

11. The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 recites, among other things, a method of charging several electrochemical cells, wherein the charging current is calculated as:

$$-I_{\text{charge}} = A \exp [-B/2T] * S.$$

Claims 9 and 10 recite, among other things, a method of charging electrochemical cells, characterized in that before one cell has reached the threshold voltage and while the voltage difference between this cell and a cell which has a voltage of minimum charge is greater than a predetermined value, a part of the charging of this cell is shunted.

The art of record does not disclose the above limitations, nor would it be obvious to modify the art of record so as to include either of the above limitations.

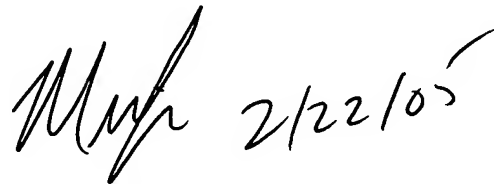
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Berhanu whose telephone number is 571-272-8430. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michel Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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